**Montana Regional Seismic Network Performance: an evaluation through SNES method**

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A properly organized seismic network is a valuable tool for monitoring seismic zones and evaluating seismic hazard. In this paper we analyze the location performance of the Montana Regional Seismic Network by SNES method (Seismic Network Evaluation through Simulation, D'Alessandro et al., 2010).

This method permits us to construct, as a function of magnitude, hypocentral depth and confidence level, maps of the number of active stations in the location procedure and the relative azimuthal gaps and confidence intervals in hypocentral parameters regarding both the geometry of the seismic network and the use of an inadequate velocity model. The Montana Regional Seismograph Network is comprised of 38 stations deployed over an area of approximately 50,000 $km^2$. Montana and immediately surrounding regions have a high level of seismicity that includes approximately 1500 locatable earthquakes annually, most of which occur along the Intermountain Seismic Belt and Centennial Tectonic Belt in the northern Rocky Mountains. Through application of the SNES method, we show that the Montana Regional Seismic Network provides the best monitoring coverage in the Flathead Valley of northwestern Montana and it provides a threshold of completeness down to magnitude 1.8 for most of western Montana. We delineate some seismogenic areas of western Montana, including the central portion of the Centennial Tectonic Belt in extreme southwestern Montana, that are not adequately covered by the existing network. The SNES technique provides guidance for optimal upgrades to the network to provide adequate monitoring coverage for the seismogenic parts of the Northern Rocky Mountains.